

Abstract

Process for producing ion exchange membranes. A matrix material that comprises a polymeric component chosen from the group consisting of monomeric and oligomeric polymer precursors and cross-linkable polymers is provided. Ion cation or anion exchange particles, or proton or hydroxyl or ion conducting particles, or cation or anion exchange polymers, or proton or hydroxyl or ion conducting polymers are introduced in the matrix. The particles are mixed or the polymer is dissolved with the matrix. The resulting mixture is formed into membrane configuration. The particles or the domains of the polymer formed by polymer-matrix phase separation upon solvent evaporation or cooling, are ordered by an electric field. If the matrix comprises or consists of a polymer precursor or a cross-linkable polymer, the precursor is cured concurrently with the ordering of the particles, or if the matrix comprises a polymer solution or polymer melt the polymer solution is evaporated or the polymer melt is maintained and then cooled concurrently with the ordering of the particles.